SUMMARY OF LABORATORY ON-SITE INSPECTION FINDINGS

AMRL Soil and Aggregate Program 22nd Tour
(March 1998 to May 2000)

AGGREGATE

Compiled By: Michael J. McGough

March 2001

T84/ C128

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Satisfactory spray nozzle not presented.	1	6.7	0	NA
Total number of footnotes for test	15		21	
Percentage of the total number footnotes (AASHTO or ASTM)	1.0		1.8	

SPECIFIC GRAVITY OF FINE AGGREGATE (T84/C128)				
Conical mold did not have specified dimensions.	13	8.1	9	8.0
Crack in metal of conical mold.	0	NA	0	NA
Pycnometer not partially filled with water prior to adding specimen.	17	10.6	19	16.8
Specimen not removed from pycnometer to determine oven-dry mass (separate specimen used).	0	NA	0	NA
Incorrect amount of saturated surface dry specimen added to pycnometer.	10	6.2	6	5.3
Pycnometer not filled to 90% prior to eliminating air bubbles.	13	8.1	4	3.5
Additional material added to mold during tamping.	9	5.6	9	8.0
Pycnometer not filled to calibrated capacity correctly.	2	1.2	3	2.7
Specimen not tamped with 25 drops of tamper.	5	3.1	4	3.5
Drier than saturated surface dry specimen not cured for 30 minutes after adding water.	5	3.1	3	2.7
Specimen not dried with current of warm air.	0	NA	0	NA
Cone not filled to overflowing prior to tamping.	5	3.1	4	3.5
Masses not determined to 0.1 g.	0	NA	0	NA
Incorrect specimen mass.	15	9.3	7	6.2
Tamper not allowed to fall under gravitational attraction.	1	0.6	1	0.9
Le Chatelier flask not calibrated at correct temperature.	0	NA	0	NA
Temperature of flask and contents not determined.	3	1.9	2	1.8
Pycnometer and contents not agitated for sufficient amount of time.	4	2.5	1	0.9
Specimen not soaked for specified time.	2	1.2	1	0.9
Vacuum used to eliminate air bubbles.	0	NA	0	NA
Loose sand not removed from around base of mold.	1	0.6	1	0.9
Mass of second saturated surface dry specimen not within 0.2 g of specimen added to pycnometer.	11	6.8	2	1.8

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Temperature of flask and contents not adjusted to proper temperature.	8	5.0	7	6.2
Specimen washed over No. 200 sieve prior to testing.	1	0.6	1	0.9
Seal between fruit jar and top not water-tight.	0	NA	0	NA
Provisional cone test performed incorrectly.	9	5.6	7	6.2
Mass of pycnometer filled with water not determined.	0	NA	0	NA
After oven drying, material not cooled for 1 hour.	6	3.7	6	5.3
Lachatelier's flask was used for standard test.	1	0.6	1	0.9
Oven-dry mass not determined correctly.	1	0.6	3	2.7
Oven did not maintain temperature of 110°C.	9	5.6	4	3.5
Paper towel may have absorbed some fine material.	1	0.6	1	0.9
Tamper did not meet specifications.	NA	NA	1	0.9
Volume of pycnometer not reproduceable to	1	0.6	1	0.9
Material not spread on a flat surface.	2	1.2	2	1.8
Specimen not soaked 15 - 19 hours.	1	0.6	NA	NA
Tamper was not dropped from 5 mm.	4	2.5	2	1.8
Specific gravity was not determined using specified method.	1	0.6	1	0.9
Total number of footnotes for test	161		113	
Percentage of the total number footnotes (AASHTO or ASTM)	11.2		9.7	
SPECIFIC GRAVITY OF COARSE AGGREGATE (T85/C127)				
Incorrect immersion water temperature.	16	8.9	17	12.9
Sample container in unsatisfactory condition.	0	NA	0	NA
Suspension apparatus not wire of smallest practical size.	16	8.9	0	NA
Basket not constructed of No. 6 mesh or finer.	4	2.2	5	3.8
No overflow outlet on water tank.	19	10.6	0	NA
Sample container not one of the specified designs.	2	1.1	5	3.8
Large absorbent cloth not presented.	1	0.6	6	4.5
Weighing sequence for saturated surface dry and immersed in water reversed.	14	7.8	15	11.4
Sample container not shaken while immersed.	19	10.6	18	13.6
Absorbent cloth dampened prior to drying specimen.	0	NA	0	NA

T85/ C127

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Incorrect specimen mass.	5	2.8	8	6.1
Two tests performed, results averaged.	0	NA	0	NA
Sample container not completely immersed during weighing.	18	10.0	14	10.6
Evaporation not avoided during drying.	18	10.0	14	10.6
Specimen not dried until visible films of water removed.	2	1.1	2	1.5
Specimen not dried to constant mass prior to immersion period.	10	5.6	10	7.6
Oven-dry mass of specimen not determined after testing.	3	1.7	2	1.5
Saturated surface dry specimen not immediately weighed in water.	0	NA	0	NA
Specimen not immersed for specified time.	3	1.7	0	NA
Specimen not rolled in cloth to remove visible films of water.	1	0.6	2	1.5
Saturated surface dry condition not achieved prior to weighing.	2	1.1	2	1.5
Specimen not washed.	6	3.3	6	4.5
Masses not determined to 1 g or 1%.	3	1.7	3	2.3
Oven did not maintain temperature of 110°C.	6	3.3	1	0.8
Constant water level not maintained while immersed.	10	5.6	2	1.5
Sample not dried after washing and prior to testing.	1	0.6	0	NA
Sample not cooled prior to weighing.	1	0.6	0	NA
Total number of footnotes for test	180		132	
Percentage of the total number footnotes (AASHTO or ASTM)	12.5		11.3	

LOS ANGELES ABRASION (T96/C131)				
Cylinder of machine not horizontal.	6	5.3	7	8.0
Cover on opening of machine not dust-tight.	35	30.7	28	32.2
No. 12 sieve in unsatisfactory condition.	0	NA	0	NA
Counter on machine not operating.	9	7.9	0	NA
Shelf in machine in unsatisfactory condition.	7	6.1	3	3.4
Grading charge weights could not be adjusted to specifications.	15	13.2	14	16.1
12 spheres not presented for Grading A.	1	0.6	1	1.1
Machine did not have specified dimensions.	3	2.6	5	5.7

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Machine not securely fastened to floor.	0	NA	0	NA
Inner shelf bolts on machine did not provide dust-tight seal.	1	0.9	1	1.1
Shelf on machine did not extend full length of cylinder.	2	1.8	1	1.1
Machine did not have specified rotation speed.	2	1.8	2	2.3
Shelf in machine not mounted in horizontal plane.	1	0.9	0	NA
Dust not returned to machine when demonstrating Note 6 procedure.	0	NA	0	NA
Preliminary separation on sieve coarser than No. 12 not performed.	17	14.9	14	16.1
Specimen not dried to constant mass.	0	NA	0	NA
Machine not equipped with counter.	3	2.6	0	NA
Masses not determined to 1 g or 15.	1	0.9	1	1.1
Sample preparation incorrect.	2	1.8	1	1.1
Oven did not maintain temperature of 110°C.	1	0.9	0	NA
Specimen not rotated 500 times.	5	4.4	3	3.4
Shelf not located properly.	2	1.8	5	5.7
Sphere did not meet specifications.	1	0.9	1	1.1
Total number of footnotes for test	114		87	
Percentage of the total number footnotes (AASHTO or ASTM)	7.9		7.5	
SULFATE SOUNDNESS (T104/C88)				
Complete set of sieves not presented.	28	11.7	22	19.3
Barium chloride not presented or not 0.2 M.	26	10.8	20	17.5
Sulfate solution not presented.	1	0.4	1	0.9
Sulfate solution discolored.	6	2.5	5	4.4
Temperature of sulfate solution did not meet specifications.	20	8.3	15	13.2
Specific gravity of solution did not meet specifications.	12	5.0	10	8.8
Oven evaporation rate did not meet specifications or not determined.	10	4.2	7	6.1
Hydrometer or other device to check specific gravity not presented.	1	0.4	1	0.9
Hydrometer not readable to 0.001.	3	1.3	2	1.8
Specimen containers not perforated.	3	1.3	1	0.9
Specimen containers in unsatisfactory condition.	2	0.8	2	1.8

T104/ C88

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Final wash not performed correctly.	28	11.7	23	20.2
Barium chloride not used.	4	1.7	3	2.6
Fine aggregate not washed on No. 50 sieve.	5	2.1	3	2.6
Fine aggregate not sieved second time to refusal.	14	5.8	9	7.9
Fine aggregate procedure not demonstrated.	3	1.3	1	0.9
Temperature of aggregate not checked before immersion.	19	7.9	0	NA
Temperature recorder was not presented.	29	12.1	0	NA
Oven did not maintain temperature of 110°C.	6	2.5	1	0.9
Salt cake not broken up prior to immersion of sample.	1	0.4	1	0.9
Coarse aggregate final sieving not done on correct sieves.	2	0.8	2	1.8
Thermometer not readable to xxx	6	2.5	1	0.9
Solution volume was insufficient.	1	0.4	0	NA
Fine aggregate final sieving not done on correct sieves.	2	0.8	1	0.9
Specimen not allowed to drain for 15 ± 5 minutes.	1	0.4	1	0.9
Incorrect sample mass.	3	1.3	2	1.8
Specimen not washed and dried before the test began.	3	1.3	1	0.9
Solution of insufficient volume.	1	0.4	1	0.9
Total number of footnotes for test	240		114	
Percentage of the total number footnotes (AASHTO or ASTM)	16.7		9.8	
FRIABLE PARTICLES (T112/C142)				
Specimen containers not rust-resistant.	2	8.3	1	4.3
Specimen not washed prior to testing by T11/C117.	4	16.7	2	8.7
Particles pressed against hard surface.	0	NA	0	NA
Specimen not spread in thin layers.	0	NA	2	8.7
Material visually identified as shale and/or friable particles removed.	0	NA	0	NA
Oven did not maintain temperature of 110°C.	4	16.7	3	13.0
Not soaked in distilled water.	2	8.3	3	13.0
Residue of friable particles not removed by wet sieving.	5	20.8	5	21.7
Complete set of sieves not presented.	4	16.7	4	17.4

T113/ C123

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Specimen not washed.	2	8.3	2	8.7
Incorrect specimen mass.	1	4.2	1	4.3
Total number of footnotes for test	24		23	
Percentage of the total number footnotes (AASHTO or ASTM)	1.7		2.0	
LIGHTWEIGHT PIECES (T113/C123)				
No. 50 sieve cloth skimmer not presented.	8	34.8	6	35.3
Heavy liquid not presented.	1	4.3	0	NA
Specific gravity of heavy liquid did not meet specifications.	4	17.4	4	23.5
Hydrometer or other device to check specific gravity not presented.	0	NA	0	NA
Specimen not added into heavy liquid container.	0	NA	0	NA
Fine aggregate not agitated prior to decanting.	0	NA	0	NA
Pieces that were not floating were decanted.	0	NA	1	5.9
Heavy liquid decanted through No. 4 sieve.	0	NA	0	NA
Heavy liquid not recovered and poured back into specimen container.	1	4.3	1	5.9
Oven did not maintain temperature of 110^{o}C.	1	4.3	1	5.9
Mass not determined to 1g.	1	4.3	1	5.9
Protective gloves and goggles not presented.	1	4.3	1	5.9
Volume of liquid insufficient.	1	4.3	1	5.9
Incorrect sample prep.	2	8.7	1	5.9
Material not SSD when test began.	2	8.7	NA	0
Oven dry mass not determined.	1	4.3	NA	0
Total number of footnotes for test	23		17	
Percentage of the total number footnotes (AASHTO or ASTM)	1.6		1.5	
SAND EQUIVALENT (T176/D2419)				
Mechanical shaker not presented.	22	27.2	0	NA
Mechanical shaker not one of the designs specified.	0	NA	0	NA
Mechanical shaker not fastened to counter.	6	7.4	4	13.8
Mechanical shaker did not have counter.	0	NA	0	NA
Counter on manual shaker not operating.	0	NA	0	NA

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Working solution not 36 in. above work surface.	6	7.4	2	6.9
Work surface not free of vibration.	0	NA	0	NA
Work surface exposed to direct sunlight.	1	1.2	0	NA
End of irrigator tube not pinched closed.	2	2.5	1	3.4
Temperature of solution did not meet specifications.	2	2.5	0	NA
Weighted foot mass did not meet specifications.	0	NA	0	NA
Inside diameter of cylinder did not meet specifications.	2	2.5	1	3.4
Funnel mouth diameter not 4 in.	2	2.5	0	NA
Solution not free of fungus.	0	NA	0	NA
Cylinder was cracked.	0	NA	0	NA
Bottom of cylinder not tapped with hand to release air bubbles.	6	7.4	4	13.8
Irrigation procedure performed before mechanical shaking procedure.	0	NA	0	NA
Material clinging to cylinder walls not rinsed down.	1	1.2	1	3.4
Bottom of tin not tapped on hard surface while filling.	6	7.4	0	NA
After splitting or quartering, specimen not oven-dried prior to testing.	0	NA	0	NA
Wetted specimens not allowed to stand for 10 minutes.	1	1.2	1	3.4
Referee Method - material not oven-dried prior to testing.	0	NA	0	NA
Specimens not dried to constant mass prior to testing.	1	1.2	2	6.9
Liquid level not 15 in. after removing irrigation tube.	3	3.7	4	13.8
All fines not removed from +No. 4 material.	7	8.6	0	NA
Hand shaking procedure incorrect.	1	1.2	0	NA
Cylinder not placed in upright position after shaking.	0	NA	0	NA
Initial sample not split or quartered to yield four 3-oz. tins of material.	0	NA	1	3.4
Pre-wet Method - sample not mixed on splitting cloth.	1	1.2	0	NA
Pre-wet Method - sample not mixed in pan with trowel and formed into a cone.	0	NA	0	NA
Higher graduation mark not recorded when readings fall between lines.	2	2.5	0	NA
Sand reading determined incorrectly.	1	1.2	0	NA
Tin not pushed through base of pile.	0	NA	0	NA
Tins not struck off level using trowel.	0	NA	0	NA

T176/D2419

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Incorrect sample mass.	1	1.2	0	NA
Working solution was more than 2 weeks/ 30 days old.	1	1.2	3	10.3
Bottle not equipped with a satisfactory siphon assembly.	1	1.2	1	3.4
Splitting or quartering cloth not presented.	1	1.2	0	NA
Solution more than 30 days/ 2 weeks old.	0	NA	4	13.8
Solution did not contain fomaldehyde.	1	1.2	0	NA
Flat pan not used for mixing.	1	1.2	0	NA
Clay reading determined incorrectly.	1	1.2	0	NA
Air-Dry Method - Preparation incorrect	1	1.2	0	NA
Total number of footnotes for test	81		29	
Percentage of the total number footnotes (AASHTO or ASTM)	5.6		2.5	
AGGREGATE DURABILITY (T210/D3744)				
Modified Tyler shaker or evidence of comparison results not presented.	7	19.7	6	10.7
Gasket not made of rubber.	2	3.6	2	3.6
Mechanical shaker not presented (T176).	0	NA	0	NA
Working solution not on shelf 36 in. above work surface.	2	3.6	2	3.6
Collection pan did not meet specifications.	5	9.1	4	7.1
Mass of weighted foot assembly did not meet specifications.	5	9.1	5	8.9
Aggregate not initially dried at temperature of 60^{o}C or less.	2	3.6	2	3.6
Contents of vessel not agitated prior to pouring over nested sieves.	1	1.8	1	1.8
Cylinder not filled with 7 mL of solution prior to adding wash water.	4	7.3	4	7.1
Water poured into vessel before specimen added.	1	1.8	1	1.8
No. 4 sieve not nested above No. 200 sieve.	2	3.6	2	3.6
Entire contents of vessel not poured over sieve nest.	2	3.6	2	3.6
Wash water not stirred prior to adding to cylinder.	0	NA	0	NA
Procedure A - A jarring action not applied to No. 200 sieve.	2	3.6	2	3.6
Volume of dirty wash water not 1000 mL.	2	3.6	3	5.4
Cylinder and contents not agitated after 600 seconds.	3	5.5	3	5.4
Before transferring into the cylinder, the wash water was not mixed immediately.	1	1.8	2	3.6

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Wash water not added to 15 inch mark.	0	NA	1	1.8
Cylinder and contents not turned 20 times in 35 seconds.	1	1.8	0	NA
Quartering or splitting cloth not presented.	4	7.3	4	7.1
Distilled water not presented.	2	3.6	3	5.4
Tin was not struck off level.	1	1.8	1	1.8
Agitator was not mounted.	1	1.8	1	1.8
Mass of material in tin not determined.	0	NA	2	3.6
Improper sample prep.	2	3.6	0	NA
Stock solution was not used, working solution was.	1	1.8	1	1.8
Agitator stroke length was not 44.5 ± 0.6 mm.	1	1.8	1	1.8
Funnel was not presented.	1	1.8	1	1.8
Total number of footnotes for test	55		56	
Percentage of the total number footnotes (AASHTO or ASTM)	3.8		4.8	
REDUCING FIELD SAMPLES (T248/C702)				
Chute width not ½ to 3/4 in. for fine aggregate.	3	14.3	4	20.0
Chute width did not meet specifications for coarse aggregate.	1	4.8	0	NA
Splitter did not have even number of chutes.	0	NA	0	NA
Sample not uniformly distributed from edge to edge.	4	19.0	5	25.0
Fine aggregate not drier than saturated surface dry when splitter was used.	1	4.8	0	NA
Quartering procedure not performed correctly.	1	4.8	1	5.0
Feeder pan not used.	9	42.9	10	50.0
Oven did not maintain temperature of 110°C.	1	4.8	0	NA
Entire specimen was not split.	1	4.8	0	NA
Total number of footnotes for test	21		20	
Percentage of the total number footnotes (AASHTO or ASTM)	1.5		1.7	
MOISTURE CONTENT OF AGGREGATE (T255/C566)				
Incorrect specimen mass.	2	33.3	3	50.0
Oven did not maintain temperature of 110°C.	3	50.0	2	33.3
Loss of moisture not avoided.	1	16.7	1	16.7

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Total number of footnotes for test	6		6	
Percentage of the total number footnotes (AASHTO or ASTM)	0.4		0.5	
UNCOMPACTED VOID CONTENT (T304/C1252)				
Oven did not maintain temperature of 110°C.	2	1.0	2	1.4
No glass plate presented or did not meet specification.	28	14.7	24	16.4
Two test runs were not performed.	4	2.1	3	2.1
Cylindrical measure not calibrated or not done correctly.	26	13.6	20	13.7
Metal spatula did not conform.	75	39.3	52	35.6
Material not leveled with a spatula.	24	12.6	19	13.0
Uncompacted void content not calculated or not correctly.	12	6.9	11	7.5
Total mass not to specification.	4	2.1	4	2.7
Diameter of funnel opening not to specifications.	2	1.0	1	0.7
Cylindrical measure did not conform to specifications.	2	1.0	3	2.1
Pan to avoid loss not presented.	1	0.5	0	NA
Material not leveled with one pass of the spatula.	4	2.1	1	0.7
Sample not washed.	3	1.6	1	0.7
Jar presented was cracked.	1	0.5	1	0.7
Funnel stand did not conform to spec.	2	1.0	3	2.7
Material was not recombined for a second test run.	1	0.5	1	0.7
Total number of footnotes for test	191		146	
Percentage of the total number footnotes (AASHTO or ASTM)	13.3		12.5	
FLAT AND ELONGATED PARTICLES (D4791)				
Not separated into 3 categories.			2	3.9
Flat and elongated determined incorrectly.			25	49.0
Flat particles determined incorrectly.			6	11.8
Elongated particles determined incorrectly.			5	9.8
Not evaluated according to Section 8.3.			3	5.9
Total mass not to specification.			2	3.9
Proportional caliper not to specification.			5	9.8

D4791 - D5821

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
Oven did not maintain temperature of 110°C.			1	2.0
Calculations done incorrectly.			1	2.0
Procedure was not demonstrated.			1	2.0
Total number of footnotes for test			51	
Percentage of the total number footnotes (AASHTO or ASTM)			4.4	

Description of Footnote	# of Labs AASHTO	% of Total	# of Labs ASTM	% of Total
PERCENTAGE OF FRACTURED PARTICLES (D5821)				
Not washed.			2	14.3
Not separated into 3 categories.			9	64.3
Oven did not maintain temperature of 110°C.			0	NA
Calculations done incorrectly.			3	21.4
Total number of footnotes for test			14	
Percentage of the total number footnotes (AASHTO or ASTM)			1.2	